

## Phase 4: Implementation

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### Design – Construction – Project Acceptance



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### ESPC project construction is much like any other federal construction project.

- Notable exceptions:
  - Commissioning requirement
  - Post-installation M&V proven and documented in report
  - ESCO typically provides construction management
  - No progress payments



## Phase 4: Project Implementation

### Design – Construction – Project Acceptance

1 – 2 years or longer

#### Key

★ Agency Action

□ ESCO Action

\*With Agency  
Participation/Oversight

★ 1. Post-Award Conference

2. Project Design and Review

□ 3. Construction, inspections, documentation, training★

□ 4. Commissioning and Post-Installation M&V★

★ 5. Acceptance of installed project

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## Best Practices for Project Implementation

- Keep the ESCO and agency on the same page to avoid delays, unintended outcomes, and backtracking.
- Hold bi-weekly meetings with the ESCO and agency teams.
  - Require attendance of the ESCO's site superintendent so that any issues can be addressed during the meetings.
- Consult your FEMP experts before issues become problems

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## Post-Award Conference

- Participants
  - Agency — CO, COTRs, inspectors, others
  - ESCO — Project manager, managers for design, construction, commissioning, M&V, and performance-period services
- Purpose
  - Review roles, responsibilities, expectations, timelines, and communication protocols
  - Review schedules for design, construction
  - Establish protocols for site access and submittal review



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## Phase 4: Project Implementation

### Project Design and Agency Review

#### ★ 1. Post-Award Conference

#### 2. Project Design and Review

- ☐ Final Project Design
- ☐ Design Submittals
- ★ Agency review and approval
- ★ ☐ ESCO provides insurance and bonds
- ★ Notice to Proceed with Construction

#### Key

- ★ Agency Action
- ☐ ESCO Action
- \*With Agency Participation/Oversight

#### 3. Construction, inspections, documentation, training★

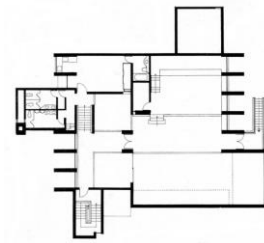
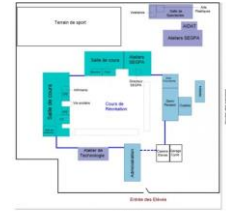
#### 4. Commissioning and Post-Installation M&V★

#### ★ 5. Acceptance of installed project

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## Agency Review and Approval of Submittals

- Agency verifies:
  - Compliance with requirements in TO
  - Design clearly addresses ECM interfaces with existing equipment
  - Drawing particulars are in compliance with TO
- Submittals must be approved before construction may begin
- ESCO's submittals constitute requirements of the contract after acceptance by agency
- FEMP ESPC team reviews for advanced technologies



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## Notice to Proceed with Construction/Installation

CO issues notice to proceed AFTER:

- Agency approves ESCO's designs, construction plans, related submittals
- ESCO provides
  - Acceptable performance and payment bonds (as required)
  - Insurance certificates



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## Phase 4: Project Implementation

### Construction

- ★ 1. Post-Award Conference
- 2. Project Design and Review
- 3. Installation/Construction, inspections, documentation, training★
- 4. Commissioning and Post-Installation M&V★
- ★ 5. Acceptance of installed project

#### Key

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## Agency Responsibilities During Installation

- Monitoring of construction
- QC plan logs
- Space access
- Punch lists
- Verifies proper ECM installation per TO requirements, design/installation plans, and approved submittals



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## Agency Post-Installation Activities

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- Coordinates inspections of rebate-related ECMs with ESCO and utility
- Reviews any revised post-installation submittals
- Coordinates agency staff training with ESCO
- Verifies resolution of any ECM performance deficiencies
- Monitors punch list



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## Agency verifies receipt/reviews:

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- **Post-installation deliverables**
  - As-built drawings
  - Spare parts lists
  - Manufacturer warranties
  - ECM training materials
  - O&M training materials, manuals, procedures
  - Commissioning report
  - Post-installation M&V report



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## Phase 4: Project Implementation

### Commissioning and Pre-Acceptance M&V

★ 1. Post-Award Conference

2. Project Design and Review

□ 3. Construction, inspections, documentation, training★

□ 4. Commissioning and Post-Installation M&V★

★ 5. Acceptance of installed project

#### Key

★ Agency Action

□ ESCO Action

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Participation/Oversight

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## Commissioning

- Verifies and documents proper installation and functional performance of equipment
  - “Kicking the tires”
  - Does installation meet “design intent,” e.g., are temperature and lighting requirements being met (per directives of TO RFP)?
- Mostly completed before acceptance
  - Some checks after acceptance are required, such as summer performance of chillers installed in winter, steam trap performance in winter

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## Post-Installation M&V Report

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- Agency reviews report and verifies ESCO compliance with M&V Plan, and that:
  - Energy and O&M baseline data is consistent with agreed-upon baseline conditions
  - Energy rates for first year of performance period are as specified in TO
  - Installed ECMs have the potential to meet or exceed the guaranteed annual cost savings
- FEMP ESPC Team also reviews Post-Installation Report

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## Government Witnessing

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**The purpose of witnessing commissioning and M&V is to independently verify performance of ECMs.**

- Best Practice: Designate a knowledgeable government witness to accompany the ESCO during M&V activities.
- Focus on:
  - Critical systems – EMCS set points, chiller/boiler performance tests
  - ECMs generating the most energy/cost savings
  - Sampling proper installation of ECMs such as lighting, motors, VFDs



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## Phase 4: Project Implementation

### Project Acceptance

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★ 5. Acceptance of installed project

– Partial Acceptance

– Handling Changes

– Preparing for ESPC Administration

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## Agency Acceptance Responsibilities

- Agency is obligated to perform oversight and review in the timeframes described in the M&V plan (contract).
  - If agency delays project acceptance and scheduled payments to the ESCO, the agency may be liable for related costs incurred by the ESCO.
- Before acceptance ensure that
  - ECMs are performing as specified
  - Required submittals received
  - Acceptance checklist is noted with dates for each item, signed off by the COTR, and forwarded to the CO.

### Partial Acceptance

- Early acceptance of individual ECMs is common, when they are producing savings well before full project acceptance.

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## Handling Changes During Implementation

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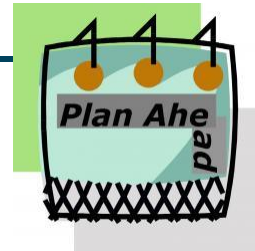
- Variances between design and as-built installation
  - ESCO and agency should track changes
  - Changes and energy impacts should be documented in Post-Installation Report
- Preferred: Handle changes so that no revision of TO schedules or financing structure are required
- Timely negotiations preserve the project schedule

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## Prepare for Contract Administration

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- Follow your Contract Management Plan – This plan establishes continuity of contract administration as individuals come and go.
  - Prepare plan at TO award
  - Follow the plan or modify during design/construction and after project acceptance
- Maintain all ESPC project documents — especially M&V, commissioning data, O&M manuals, training materials
  - Audits, turnover, ...



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## Review

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Q1: How is the ESPC construction process different from conventional design-building construction?

A: Commissioning and post-installation M&V are required by contract.

Q2: Can an agency accept a project even though MINOR punch list items are not yet completed?

A: Yes

Q3: Do the ESCO's submittals (designs, drawings, etc.) constitute requirements of the contract?

A: Yes.

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Q4: What is the main M&V-related activity during the construction period?

A: Post-installation M&V activities and report

Q5: Name two post-installation ESCO submittals related to O&M.

A: O&M manuals & related O&M procedures

Spare parts lists and provided spare parts

Manufacturer warranties

O&M training materials & proposed schedule

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## **Phase 5 Post-Acceptance Performance**

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